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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/598,204	08/21/2006	Mark Thomas Johnson	NL 040194	1127
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EXAMINER				
SPAR, ILANA L				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/598,204

**Applicant(s)**

JOHNSON ET AL.

**Examiner**

ILANA SPAR

**Art Unit**

2629

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 September 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/C)
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date: \_\_\_\_\_

**DETAILED ACTION**

***Response to Amendment***

1. The following Office Action is responsive to the amendments and remarks received on September 28, 2009.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-11 are rejected under 35 U.S.C. 102(e) as being anticipated by Zehner et al. (US Patent Publication No. 2003/0137521).

With reference to claim 1, Zehner et al. teaches an electrophoretic display comprising a drive unit (16, see paragraph 88, lines 2-4) and at least one pixel cell that is arranged with drive electrodes (see paragraph 89, lines 10-20) and that contains an electrophoretic media (see paragraph 133, line 6) that is responsive to an electric field applied between said drive electrodes (see paragraph 89, lines 20-24);

wherein said drive unit is arranged to provide said pixel cell with a drive signal (see paragraph 88, lines 2-4) and is switchable between a monochrome drive scheme and a grayscale drive scheme (see paragraph 195, lines 10-17 – the controller

determines whether or not to switch between monochrome and grayscale drive schemes),

said monochrome drive scheme involving drive signals providing for only two extreme optical pixel states (see paragraph 124, lines 1-2), and

said grayscale drive scheme involving drive signals providing for said two extreme optical pixel states and at least one additional, intermediate pixel state between said two extreme optical pixel states (see paragraph 124, lines 2-3),

wherein said grayscale drive scheme provides drive signals for said two extreme optical states that are different than said monochrome drive scheme for said two extreme optical states (see paragraph 195, lines 5-10 – the difference being the length of the signal), and

wherein said drive unit furthermore is operative to apply a separate transition drive signal when switching from said grayscale drive scheme to said monochrome drive scheme, whereby said transition drive signal is arranged such that said transition drive signal counteracts the build-up of remnant DC voltage in the pixel cell (see paragraph 196, lines 10-13 and lines 33-42).

It is understood that the display of Zehner et al., which is capable of providing both the monochrome and grayscale display modes according to the type of image to be displayed (see paragraphs 195 for monochrome driving and paragraphs 178-182 for grayscale driving), would be able to select the correct mode for adjusting the pixels as necessary, according to incoming image data.

With reference to claim 2, Zehner et al. teaches all that is required with reference to claim 1, and further teaches a number of pixel cells that are addressable in image frames, wherein said grayscale drive scheme is employed for image frames that include at least one intermediate pixel state (see paragraphs 178-182) and the monochrome drive scheme is employed for image frames that include extreme states only (see paragraph 195, lines 1-5).

With reference to claim 3, Zehner et al. teaches all that is required with reference to claim 1, and further teaches a memory unit (look-up table) wherein pre-defined drive signals corresponding to the respective drive schemes are stored accessible by the drive unit (see paragraph 70, lines 1-4, paragraph 73, lines 1-3, and paragraph 196, lines 10-13).

With reference to claim 4, Zehner et al. teaches all that is required with reference to claim 1, and further teaches that said transition drive signal drives the pixel cell repeatedly to each of said two extreme optical pixel states so as to remove any remnant DC voltage in the pixel cell before the monochrome drive scheme is initiated (see paragraph 196, lines 33-42).

With reference to claim 5, Zehner et al. teaches all that is required with reference to claim 1, and further teaches that said transition drive signal is a drive signal in the grayscale drive scheme that corresponds to a one of the two extreme optical pixel states of the monochrome drive scheme that would have immediately followed said transition drive signal and that replaces the one of the two extreme optical pixel states

of the monochrome drive scheme that would have immediately followed said transition drive signal (see paragraph 196, lines 10-13 and lines 33-42).

With reference to claim 6, Zehner et al. teaches all that is required with reference to claim 1, and further teaches that the transition drive signal is selected from a transition drive scheme that comprises more than one alternative transition drive signals (see paragraph 196, lines 10-13 – the transition signal is selected from the look-up table, which contains many transition drive signals applicable for different transition scenarios).

With reference to claim 7, Zehner et al. teaches all that is required with reference to claim 1, and further teaches that the transition drive signal is applied when switching to said monochrome drive scheme only when switching from a subset of the pixel states provided for by said grayscale drive scheme that is less than all of the pixel states of said grayscale drive scheme, otherwise the transition drive signal is not applied (see paragraph 195, lines 10-17).

Zehner et al. teaches that the monochrome drive scheme does not apply transition signals when switching from one monochrome display to another (i.e. black to white or vice versa). It is therefore inherent that the transition signal is only applied to the monochrome drive scheme when the frame preceding the monochrome drive scheme is not also a monochrome drive scheme, i.e. it is a grayscale scheme.

With reference to claim 8, Zehner teaches all that is required with reference to claim 7, and further teaches that said subset of pixel states excludes said extreme pixel states (see paragraph 195, lines 1-5).

As explained above, when the monochrome drive scheme frame is preceded by another monochrome drive scheme frame (i.e. black or white pixels, the extreme pixel states), no transition signal is applied.

With reference to claim 9, Zehner et al. teaches all that is required with reference to claim 1, and further teaches that said transition drive signal is a drive signal that corresponds to a signal in the monochrome drive scheme that would have immediately followed said transition drive signal but modified with an additional remnant DC voltage reducing voltage pulse and that replaces the signal in the monochrome drive scheme that would have immediately followed said transition drive signal (see paragraph 196, lines 10-13 and lines 33-42).

With reference to claim 10, Zehner et al. teaches all that is required with reference to claim 9, and further teaches that said additional remnant DC voltage reducing voltage pulse is employed before said monochrome drive scheme drive signal (see paragraph 188 – before the pixel arrives at the correct level it is driven to the extreme pixel states).

With reference to claim 11, Zehner et al. teaches a method for driving an electrophoretic display, said method comprising the steps of:

receiving image information regarding an image to be displayed (see paragraph 82, lines 3-6);

selecting a drive scheme from a monochrome updating drive scheme and a grayscale updating drive scheme (see paragraph 195, lines 10-17), depending on the existence of grayscales in the image to be displayed, wherein said monochrome drive

scheme includes drive signals providing for only two extreme optical pixel states (see paragraph 124, lines 1-2), and said grayscale drive scheme includes drive signals providing for said two extreme optical pixel states and at least one additional, intermediate pixel state between said two extreme optical pixel states (see paragraph 124, lines 2-3), wherein said grayscale drive scheme provides drive signals for said two extreme optical states that are different than said monochrome drive scheme for said two extreme optical states (see paragraph 195, lines 5-10 – the difference being the length of the signal);

employing a transition signal in case the drive scheme is changed from the grayscale drive scheme to the monochrome drive scheme, said transition signal being such that any remnant DC voltage is reduced (see paragraph 196, lines 10-13 and lines 33-42);

employing a drive signal that is based on the selected drive scheme and that corresponds to said image to be displayed (see paragraph 188).

It is understood that the display of Zehner et al., which is capable of providing both the monochrome and grayscale display modes according to the type of image to be displayed (see paragraphs 195 for monochrome driving and paragraphs 178-182 for grayscale driving), would be able to select the correct mode for adjusting the pixels as necessary, according to incoming image data. Additionally, each transition signal takes into account the prior display state and the desired (future) display state, and uses them both as a basis the driving signal.

***Response to Arguments***

4. Applicant's arguments filed September 28, 2009 have been fully considered but they are not persuasive. Applicant argues that Zehner does not teach switching between two drive schemes, a monochrome drive scheme and a grayscale drive scheme (see page 14, lines 4-14). As Examiner has restated above, Zehner does teach two drive schemes, which are switched based on interpretation of the incoming data signal by the controller (see paragraph 195, lines 10-13). If the controller determines that a monochrome image is to be displayed, the display is driven according to the simpler, faster monochrome drive scheme. If more gray levels are required, the display is driven according to the grayscale drive scheme. This constitutes two drive schemes, which are switched based on the data to be displayed.

Applicant further argues that Zehner does not teach a transition signal when switching between the two driving schemes, rather that Zehner is pulse width modulating the signal for the purpose of limiting the DC remnant voltage (see page 15, lines 4-13 and page 16, lines 14-15). As explained above, Zehner does teach transition signals that are applied when the optical state transitions from an extreme state or a gray state to another extreme state (see paragraph 196). Further, Zehner does this for the same reason as explained in Applicant's claim 1, which is to "counteract the build-up of remnant DC voltage in the pixel cell." Therefore, Zehner teaches the same process with the same results as Applicant claims in claims 1 and 11.

For these reasons Applicant's arguments are not considered persuasive, and the rejection in view of Zehner is maintained.

***Conclusion***

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ILANA SPAR whose telephone number is (571)270-7537. The examiner can normally be reached on Monday-Thursday 8:00-4:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on (571)272-7681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Bipin Shalwala/  
Supervisory Patent Examiner, Art Unit 2629

ILS